ABSTRACT

Purpose of the study: The present in-vitro study was conducted to compare and evaluate the flexural strength of Autopolymerizing PMMA resin , CAD/CAM milled PMMA and CAD/CAM milled PEEK after being subjected to aging and thermocycling.

Materials and methods: Sixty identical samples measuring 25mm * 2mm * 2mm , according to ADA/ANSI specification no. 27 were fabricated using Auto polymerizing PMMA resin – GROUP I ; CAD /CAM milled PMMA – GROUP II and PEEK – GROUP III (20 samples in each group). The Group I (A), Group II (A) and Group III (A) test samples (10 samples in each group) were subjected to 7 days of aging/conditioning and 500 cycles of thermocycling and Group I (B), Group II (B) and Group III (B) test samples (10 samples in each group) were subjected to 14 days of aging/conditioning and 1000 cycles of thermocycling. Aging/ conditioning was done in incubator and thermocycling was done in Thermocycling unit. The flexural strength was evaluated using Universal testing machine. The data's were analyzed with Student t test and pair–wise comparison of mean values was done by ANOVA (Analysis of Variance) test. Statistical significance was considered at 5% significance level.

Results: The Flexural strength of PEEK was higher than the Autopolymerizing PMMA resin and CAD/CAM milled PMMA. The Flexural strength of PEEK subjected to 7 days of aging/conditioning and 500 cycles of thermocycling (Group III (A)) (**6628.70 Mpa**) was the highest followed by the flexural strength of PEEK subjected to 14 days of aging and 1000 cycles of thermocycling (Group III (B)) (**3760.50 Mpa**).

Conclusion: The mean flexural strength of PEEK was highly significant than the Autopolymerizing PMMA resin and CAD/ CAM milled PMMA. But, the mean flexural strength of PEEK reduced approximately by 44% while increasing the days of aging and number of thermocycling.

KEYWORDS: Flexural strength, PEEK, CAD/CAM milled PMMA, Thermocycling and Universal Testing Machine.